Boston blackboard show that it may become possible to determine the relation between the present space locus of the instant when John Hancock finished his signature to a certain immortal document, and the present time locus of the point in space which his center of gravity then occupied.

Francis E. Nipher

"Geometrical" Canals on Mars? A Suggestion

At the present writing, Mars is traveling rapidly away from the earth, but, unfortunately, its mystery remains. Much was expected from the observations to be made at the recent opposition, the most favorable one in some respects since 1892; and the planet has in fact been studied eagerly and carefully with telescopes of many sizes and kinds, and all the resources made available by the advance in our knowledge of photographic and spectroscopic processes have been drawn upon to aid in solving the problems Mars presents. The details of these observations, for the most part, have not yet been published, but enough has been written to show that the average astronomer, as well as the intelligent layman, is left in as great doubt as to the actual configuration of the surface of Mars and the meteorological conditions prevailing there as he was a year ago.

Even the fundamental question as to the size of telescope best adapted to the study of planetary detail remains an open one. On the one hand, an expert areographer, owner of a 24-inch refractor, has repeatedly claimed for his telescope "greater space-penetrating powers" (due to the combined excellences of his lens and his atmosphere) than those possessed by any other in the world, and says that it is by virtue of these powers that he can see Martian details invisible elsewhere. On the other hand, an astronomer in charge of a much larger refractor has recently said that his telescope was *too powerful*[1] to show the canals on Mars. Again we are told that to get the best results in such studies we must use comparatively small telescopes or "cap down" the object glasses of the larger instruments—even a 24-inch aperture is improved by this process, it is said.

It is hardly necessary to call attention to the very diverse views held by areographers not only as to the interpretation to be put upon many of the markings observed on Mars —in particular, the geometrical network of the "canals"—but even as to their objective reality. Some optimists had hoped that photography would effectually dispose of all doubts on the latter point, and Mr. Lowell, indeed, has stated that his photographs have forever settled the matter. But one needs only to compare the drawing made by M. E. M. Antoniadi, himself an expert student of Martian topography, from forty of Mr. Lowell's photographs[2] with the direct prints from other photographs published by Mr. Lowell himself[3] to realize that the "doctors disagree" as earnestly as ever. It would seem that the time has come for the experts to reach some definite agreement on these questions, and it is because I have a suggestion to offer that appears to be practicable and that would, if followed, undoubtedly clear the atmosphere, that I, who am merely an interested student, not an expert, have ventured to write this note.

Mr. Percival Lowell has long been known as the chief advocate of the view that the Martian "canals" and other delicate surface markings on the planet which he has so fully observed and described are objective realities, and that they offer unmistakable evidence of intelligent life on the planet. He has not only published his observations and conclusions in detail in technical publications, but he has also written several popular books on Mars—"science that reads like romance"—to support these views. He has also claimed over and over again that his telescope and his geographical location give him facilities for

[1] It is rather amusing, by the way, to note that some of our European friends seem to have missed entirely the point of this remark and have, indeed, taken it so seriously as to be offended!

[2] *Monthly Notices Royal Astronomical Society*, Vol. LXIX, p. 110, 1908.

[3] *Proceedings of the Royal Society of London*, Series A, Vol. 177, p. 132, 1906.

Martian study not enjoyed by any one elsewhere.

Suppose, then, that Mr. Lowell invite two or three other well-known expert students of planetary detail—say, for example, Mr. E. E. Barnard, of the Yerkes Observatory; Mr. W. H. Pickering, of Harvard College Observatory, and Mr. E. M. Antoniadi, of l'Observatoire de Juvisy—to come to Flagstaff and join him in observing Mars at its next opposition. Would not astronomers and the public generally accept as objective realities any surface markings observed, either visually or photographically, by all four of these experts?

These experts might perhaps also undertake, during their residence at Flagstaff, to verify the remarkable and intricate network of markings on the planets Venus[4] and Mercury[4] which have been seen at the Lowell Observatory, and only there, so far as I am aware, and which, to the uninitiated, present many points of resemblance to the "canal" system on Mars. The fact that all the members of the Lowell Observatory staff are able to see so many of these markings which, apparently, are invisible from other stations, would seem to lend additional interest to my suggestion.

Great as have been Mr. Lowell's services in stimulating zeal in planetary studies, in no way, I think, could he add more to the sure advancement of our knowledge in this field than by inviting such a committee of experts to share with him, for a time, the advantages offered by his excellent telescope and favorable atmosphere.

R. G. AITKEN

December 8, 1909

SCIENTIFIC BOOKS

The Human Body and Health. An Intermediate Text-book of Essential Physiology, Applied Hygiene and Practical Sanitation for Schools. By ALVIN DAVIDSON, M.S., A.M., Ph.D., Professor of Biology in Lafayette College. New York, American Book Company.

[4] For the markings on Mercury see *Popular Astronomy*, Vol. IV., p. 360, 1897; for the markings on Venus, *The Popular Science Monthly*, Vol. LXXV., p. 521, 1909.

This is an aggressive book. It abounds in plain statements that attract the reader and lead him on.

The author's motive and plan is indicated in the preface as follows:

> A few minutes' reflection in regard to the modern ways of living will fix in the mind of the sound reasoner the conviction that we are a careless and cruel people. Nearly one thousand human beings in the United States are dying daily of diseases which science has shown how to prevent. Streams are polluted, garbage dumped on the nearest vacant lot, fresh air and sunshine shut out of the houses by double doors and windows, and innocent children fed dirty milk because people do not realize that these acts are responsible for many of the four thousand graves daily made in our nation's cemeteries.
>
> Sanitary science and the public health can be advanced only as they are supported by an intelligent public opinion; . . . new ideas are grasped most readily by the young. Parents do not recognize that eyesight is being impaired, normal growth prevented, blood poisoned and the body starved because of customs and habits born in ignorance. . . . Anatomy and physiology is of little value to our young folks unless it helps them to practise intelligently in their daily lives the teachings of hygiene and sanitation. . . . Specific facts and full explanations are given showing how disease is caused and how the body may be kept well and strong. . . .

The contents of the book are as follows: Chapter I., The Human Body as a Living Machine; chapter II., Plants and Animals Related to Health; chapter III., The Plan of the Human Body; chapter IV., Food for the Body; chapter V., The Care and Cooking of Food; chapter VI., How Food is Used by the Body; chapter VII., Drink and Health; chapter VIII., Tobacco and other Narcotics and their Effect on Health; chapter IX., The Blood and its Passage through the Body; chapter X., Breathing and its Use; chapter XI., Air and Health; chapter XII., Cleanliness and Warmth; chapter XIII., Clothing and Colds; chapter XIV., The Bones; chapter XV., The Muscles and Exercise; chapter XVI., How the Body is Governed; chapter XVII., The Care of the Nervous System and